

Corrosion Report



Equipment Location ID 0955-002-021
Equip. Location Descrip. V-1103 DESALTED CRUDE

Remaining Life (Years) 17.60
Retirement Date 06/11/2029
Last Inspection Date 11/05/2011
Next Inspection Date 08/23/2020
Current Corrosion Rate 5.96

DP ID	MEAS METH	DP STAT	DP SZ	DT TYPE	BASE	MEAS 5	MEAS 4	MEAS 3	NEAR	LAST	MIN VALUE	CCR	REM LIFE
004.B	UT	A	24.00	PIPE	0.472 12/02					0.460 11/11	0.187	1.35	202.37
004.E	UT	A	24.00	PIPE	0.469 12/02					0.470 11/11	0.187	0.00	∞
004.T	UT	A	24.00	PIPE	0.508 12/02					0.470 11/11	0.187	4.27	66.25
004.W	UT	A	24.00	PIPE	0.509 12/02					0.470 11/11	0.187	4.38	64.55
009.1	UT	A	24.00	ELL	0.460 12/02					0.440 11/11	0.187	2.25	112.54
009.2	UT	A	24.00	ELL	0.450 12/02					0.430 11/11	0.187	2.25	108.10
009.3I	UT	A	24.00	ELL	0.550 12/02					0.530 11/11	0.187	2.25	152.58
009.3O	UT	A	24.00	ELL	0.440 12/02					0.430 11/11	0.187	1.12	216.19
009.4	UT	A	24.00	ELL	0.410 12/02					0.460 11/11	0.187	0.00	∞
009.5	UT	A	24.00	ELL	0.440 12/02					0.460 11/11	0.187	0.00	∞
010.U	UT	A	24.00	ELL	0.300 07/82	0.310 10/91		0.330 11/00	0.330 11/00	0.390 11/11	0.187	0.00	∞
015.E	UT	A	24.00	TEE	0.800 11/11						0.140	5.00	132.00
015.J	UT	A	24.00	TEE	0.750 08/85	0.710 10/91	0.800 09/95	0.720 01/98	0.740 11/00	0.780 11/11	0.187	0.00	∞
015.W	UT	A	24.00	TEE	0.790 11/11						0.140	5.00	130.00
016.E	UT	A	24.00	TEE	0.810 11/11						0.140	5.00	134.00
016.J	UT	A	24.00	TEE	0.770 08/85		0.780 09/95	0.720 01/98	0.670 11/00	0.810 11/11	0.187	0.00	∞
016.W	UT	A	24.00	TEE	0.830 11/11						0.140	5.00	138.00
017.1	UT	A	24.00	ELL	0.463 12/02					0.410 11/11	0.187	5.96	37.43
017.2	UT	A	24.00	ELL	0.451 12/02					0.440 11/11	0.187	1.24	204.53
017.3I	UT	A	24.00	ELL	0.471 12/02					0.430 11/11	0.187	4.61	52.72
017.3O	UT	A	24.00	ELL	0.443 12/02					0.430 11/11	0.187	1.46	166.32
017.4	UT	A	24.00	ELL	0.457 12/02					0.420 11/11	0.187	4.16	56.01
017.5	UT	A	24.00	ELL	0.462 12/02					0.410 11/11	0.187	5.85	38.15
020.1	UT	A	32.00	PIPE	0.390 11/11						0.292	5.00	19.60

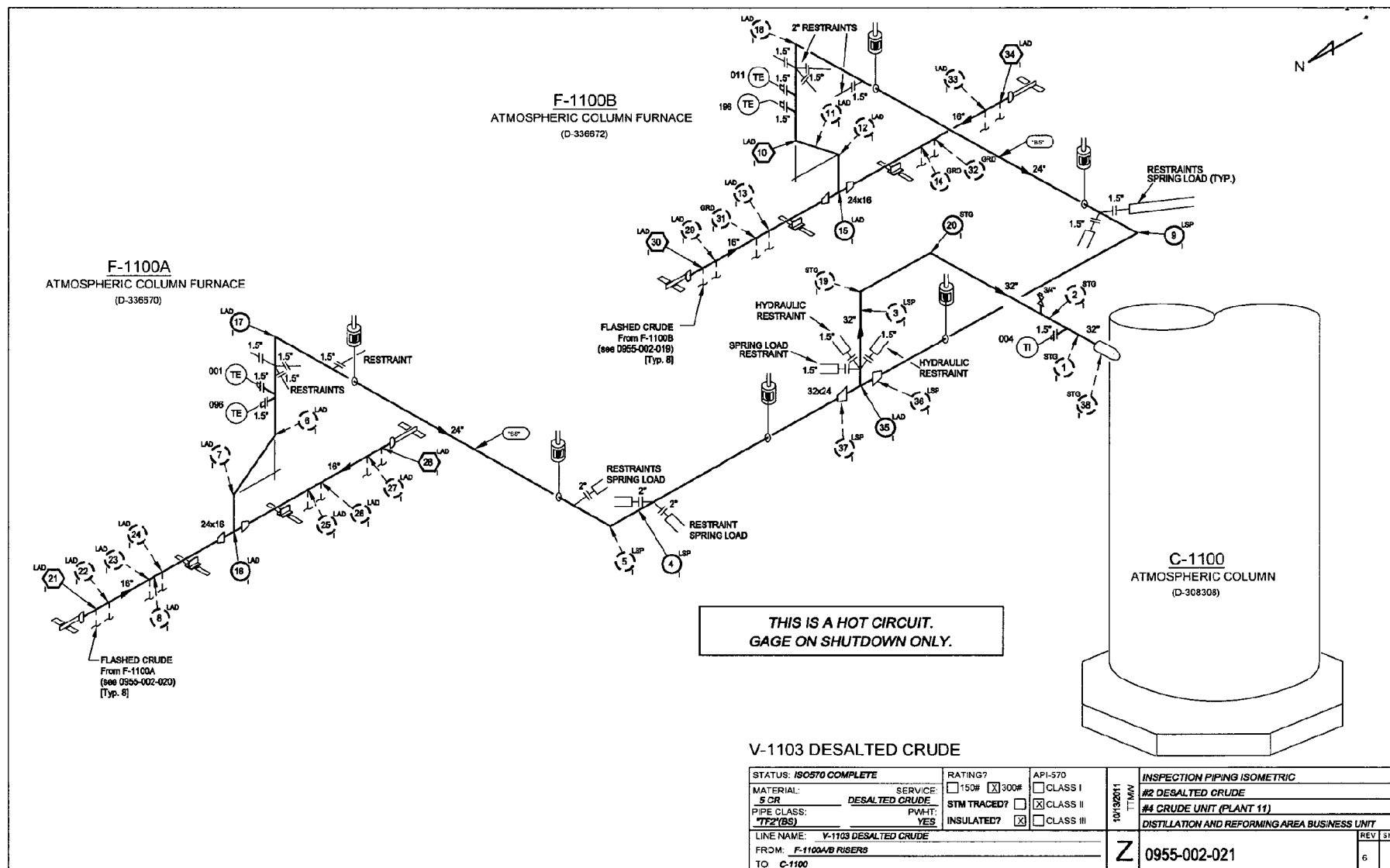
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020.2	UT	A	32.00	PIPE	0.380 11/11						0.292	5.00	17.60
020.3I	UT	A	32.00	PIPE	0.380 11/11						0.292	5.00	17.60
020.3O	UT	A	32.00	PIPE	0.380 11/11						0.292	5.00	17.60
020.4	UT	A	32.00	PIPE	0.440 11/11						0.292	5.00	29.60
020.5	UT	A	32.00	PIPE	0.460 11/11						0.292	5.00	33.60
021.U	UT	A	16.00	PIPE	0.520 09/95			0.520 11/00	0.520 11/00	0.530 11/11	0.140	0.00	∞
030.U	UT	A	16.00	PIPE	0.530 07/82		0.480 09/95	0.530 11/00	0.530 11/00	0.550 11/11	0.140	0.00	∞
034.U	UT	A	16.00	ELL	0.530 01/82	0.520 07/82	0.520 09/95	0.510 11/00	0.510 11/00	0.500 11/11	0.140	1.01	358.21
035.E	UT	A	32.00	TEE	0.380 11/11						0.140	5.00	48.00
035.J	UT	A	32.00	TEE	0.370 03/82	0.360 10/88	0.400 09/95	0.360 01/98	0.350 11/00	0.390 11/11	0.292	0.00	∞
035.W	UT	A	32.00	TEE	0.390 11/11						0.140	5.00	50.00





History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	10/18/2007	Date Available:	
History Brief Date:	10/31/2007	History Brief ID:	EI-0710185656
Event Type:	Inspection	In- Service Date:	
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	10/18/2007
Asset Type:	221	Inspection Type:	EVI
Cost Center:	K.DCRR100281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	5 Year Ext VT, Spring Strut Broken (REC-66236) & Minor Insul Dmg-No Reco		

Reliability Analysis:

Event Type:	Inspection	Worked Performed By:	Chevron - General
Cause Category:	Compliance, Inspection, PM	Program Status:	
Effect Category:	No Effect	Maintainable Item:	General
Repair Location:		Permanent Repair WO:	
Temporary Repair:		Name:	TBEA
Save:		Inspected By:	

Reliability Comments:



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	1/15/2007	Date Available:	01/15/2007
History Brief Date:	02/25/2007	History Brief ID:	VI-0702169641
Event Type:	Repair	In- Service Date:	01/15/2007
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	02/25/2007
Asset Type:	221	Inspection Type:	
Cost Center:	K.DCRR100281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Fire Damage Assessment/Visual Inspection/Replaced Spring Can		

Reliability Analysis:

Event Type:	Repair	Worked Performed By:	Chevron Maintenance
Cause Category:	Information	Program Status:	
Effect Category:	Information	Maintainable Item:	Pipe Wall
Repair Location:		Permanent Repair WO:	
Temporary Repair:		Name:	DANM
Save:		Inspected By:	DANM

Findings:

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:

On 1/15/07, the # 4 Crude Unit was in the process of plant clean-up for the planned 1Qtr/07 major T/A. Well after feed was removed and approximately 6 hours into the cleanup, the wash oil piping failed where it ties into the P-1165A discharge spool. The leak immediately flashed and impinged on the East/West overhead pipeway between pipe supports 11J-18.5 and 11J-20.5. The fire also impinged on the tubes of the E-1100 A cells causing structural damage, tube failures and a secondary fire. Once the fire was controlled, the fire continued to burn for approximately 8 hours.

A fire damage assessment team determined the fire zones in accordance the API and MTI guidelines. In general, fire zones 5/6 (800 degF plus) were discovered in a 25 foot circumference surrounding the P-1165A. Fire Zone #4 (400-800 degF) extended approximately 10' beyond zone 5/6. Fire Zone #3 (150-400 degF) extended approximately 20' beyond Fire Zone #4. Fire Zone 2 was the area affected by firewater and pump deluge systems. Fire Zone #1 indicated no damage. Structure, electrical, instrumentation and machinery damage were covered by the representatives from the specific disciplines.

The section of line near TML #4 & 5 was located in fire zone 4-5, the remainder of the line was zone 3 or less. The entire line was inspected with the following results:

1. The insulation was in tact and no hardness testing was required. The line was not bulged and considered fit for

History Brief

For Location ID: 0955-002-021 in Unit: 0955



Report Date: August 15, 2012

Data Source: Meridium

service.

The inspection was performed by Myron Makowsky of IESCO.

2. Repairs included replacement of the spring can and tensioners at TML #4/5. No additional repairs were required.



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	1/6/2005	Date Available:	01/06/2005
History Brief Date:	01/06/2005	History Brief ID:	VI-0501117990
Event Type:	Information	In- Service Date:	01/06/2005
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	01/06/2005
Asset Type:	221	Inspection Type:	
Cost Center:	K.DCRRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	F-1100B Outlet 11TC011 B/O, Shows 800+ F Deg		

Reliability Analysis:

Event Type:	Information	Worked Performed By:	Chevron Operations
Cause Category:	Operations	Program Status:	
Effect Category:	Interruption of Service	Maintainable Item:	Connections
Repair Location:		Permanent Repair WO:	
Temporary Repair:		Name:	JMJG
Save:		Inspected By:	JMJG

Findings:

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	11/20/2003	Date Available:	11/20/2003
History Brief Date:	11/20/2003	History Brief ID:	VI-0311095877
Event Type:	Inspection	In- Service Date:	11/20/2003
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	11/20/2003
Asset Type:	221	Inspection Type:	EVI
Cost Center:	K.DCRR100281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	5-Year Ext Visual Insp, No Issues		

Reliability Analysis:

Event Type:	Inspection	Worked Performed By:	Chevron Reliability
Cause Category:	Compliance, Inspection, PM	Program Status:	
Effect Category:	Information	Maintainable Item:	Refractory/Insul.
Repair Location:		Permanent Repair WO:	
Temporary Repair:		Name:	JMJG
Save:		Inspected By:	JMJG

Findings:

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	4/28/2003	Date Available:	
History Brief Date:	04/28/2003	History Brief ID:	HB-0304087477
Event Type:	Failure	In- Service Date:	
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	
Asset Type:	221	Inspection Type:	
Cost Center:	K.DCRR100281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Snubbers On Xfer Line From Atmos Furn To C-1100 B/O, W/O To Replace		

Reliability Analysis:

Event Type:	Failure	Worked Performed By:	Chevron Maintenance
Cause Category:	Operations	Program Status:	
Effect Category:	Mechanical Damage	Maintainable Item:	Hanger
Repair Location:	Field	Permanent Repair WO:	
Temporary Repair:	No	Name:	JMJG
Save:		Inspected By:	

Findings:

<u>PCA ID:</u>	PCA-002029651	<u>Condition:</u>	
<u>Inspectable:</u>	GENERAL	<u>Action:</u>	Not Resolved
<u>Sub Item:</u>		<u>Location:</u>	
<u>Part:</u>	HANGER	<u>Damage Mechanism:</u>	56
<u>Discussion:</u>		<u>PCA Work Order No :</u>	

Reliability Comments:

A work order was written to replace a broken snubber on the transfer line from F-1100A/B to C-1100. The snubber had siezed up for an unknown reason, causing the threaded connection from the shock absorber to the piping attachment to shear off (see attached document). While evaluating the job, a boilermaker noted an issue with another snubber on the line (both of these were located on the second horizontal ell on the F-1100A side of the line, just upstream of the tee where both lines connect and right at TML # 4) and notified inspection. This second snubber (out of 3 in the area) had a threaded collar that had either worked it's way out of the shock absorber body or had never been installed correctly, allowing some white plastic rings from inside to vibrate out of the shock absorber body. Photos were taken of both snubbers and sent to ABU operations management, engineering, and maintenance personnel for evaluation of the second snubber; not enough information was available to FER personnel to determine if the snubber could be fixed or if it should be replaced. -jmg 4/28/2003 3:58:17 PM



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Classification:

Method of Detection: Observation

What Happened when it Failed?

Equipment Unavailable: -

Unit Shutdown: -

Process Disruption: -

Safety Compromised: -

Environmental Impact: -

Impact Assoc. Processes: -

What was the direct cause? Vibration Fatigue

How did it fail? Mechanical Damage

Why did it fail? Maintenance Error

Why did it fail description: One snubber siezed and failed for unknown reasons, the other has been improperly maintained

What is the failure type? Equipment

What was done to the asset? Replace

Failure analysis date: 4/28/2003 12:00:00AM

failure Cost (\$):



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	2/25/2002	Date Available:	
History Brief Date:	02/25/2002	History Brief ID:	HB-0202068835
Event Type:	Information	In- Service Date:	
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	
Asset Type:	221	Inspection Type:	
Cost Center:	K.DCRR100281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INTERNAL INSPECTION OF TML 'S 38, 1, 2, 20		

Reliability Analysis:

Event Type:	Information	Worked Performed By:	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	Program Status:	
Effect Category:	Information	Maintainable Item:	Pipe Wall
Repair Location:		Permanent Repair WO:	
Temporary Repair:		Name:	STYR
Save:		Inspected By:	

Findings:

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:

AN INTERNAL INSPECTION OF THE PIPE AND WELDS WAS DONE FROM THE COLLUM TO THE SECOND MITERED JOINT. NO ERROSION OR CORROSION WAS FOUND. SEVERAL ARC STRIKES WERE FOUND, TWO OF THEM WERE 0.03" DEEP. SEVERAL WELD BUILD UP AREAS WERE FOUND AND WERE IN GOOD CONDITION.

UT gagings which appear to have been taken in the same areas noted a low of 0.25" near a "weld prep" area. This should be verified at the next opportunity. -jmg 6/18/2002 9:22:11 AM



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	6/23/1999	Date Available:	
History Brief Date:	06/23/1999	History Brief ID:	RPR-2027926
Event Type:	Information	In- Service Date:	
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	
Asset Type:	221	Inspection Type:	
Cost Center:	K.DCRR00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Line vibration, Reco written to ops/eng for analysis & repr DMM		

Reliability Analysis:

Event Type:	Information	Worked Performed By:	Chevron - General
Cause Category:	Information	Program Status:	
Effect Category:	Mechanical Damage	Maintainable Item:	Pipe Wall
Repair Location:		Permanent Repair WO:	
Temporary Repair:		Name:	DANM
Save:		Inspected By:	

Findings:

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:

The atmospheric transfer line was noticeably vibrating during inspection of an adjacent piping system. A recommendation was issued to ops/eng for analysis & repair. It appeared as if the snigger type supports were inoperable or broken.



History Brief

For Location ID: 0955-002-021 in Unit: 0955

Report Date: August 15, 2012

Data Source: Meridium

Brief Data:

Date Not Available:	7/19/1982	Date Available:	07/19/1982
History Brief Date:	11/06/2006	History Brief ID:	VI-0611163096
Event Type:	Repair	In- Service Date:	08/15/1982
Equipment ID:	0955-002-021	Critical:	L
Asset ID:	0000110847	Reference Material:	
Work Order Nbr:		Incident Event ID:	
History Type:	FXD	Inspection Date:	03/13/1982
Asset Type:	221	Inspection Type:	
Cost Center:	K.DCRR00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	F-1100A/B To C-1100 Xfer Line Repair History		

Reliability Analysis:

Event Type:	Repair	Worked Performed By:	Chevron - General
Cause Category:	Operations	Program Status:	
Effect Category:	Corrosion	Maintainable Item:	Pipe Wall
Repair Location:	Field	Permanent Repair WO:	
Temporary Repair:		Name:	JMJG
Save:		Inspected By:	JMJG

Findings:

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:

The purpose of this history brief is to document historical repairs on the F-1100A/B to C-1100 transfer line.

In March of 1982, the weld between the inlet nozzle of C-1100 (TML #38) and the 32" transfer line (TML #1) failed. The line is 5 Cr at this point. A lap patch was installed for 2 pipe diameters 360 degrees around the weld until the 7/82 shutdown; no records exist of the clamp material or any other details of the repair.

During the July 1982 shutdown, internal inspection of the accessible 32" and 24" F-1100A/B to C-1100 inlet nozzle transfer line revealed internal corrosion and pitting to 0.32" on the 32" section between TML's #38 (column nozzle) to #35 (bottom of 32" tee). All of the internal welds except for the weld at TML #2 were found corroded from 0.08" to 0.32" along the horizontal section between the inlet nozzle and the 32" tee.

The internally corroded areas were striplined on 7/19/82 with 316L per EWO # L-439 Rev 1. The plate was cut into 6" strips at the Boiler Shop and fitted/welded in the field. No preheating or PWHT was performed. Some of the corroded areas at the welds on the horizontal section were also weld built with E310MO-15 material; additional weld building occurred on the vertical section above the 32" tee on 4/20/83.

Follow-up UT/RT of the transfer line on 9/82, 3/84, 8/85, and 11/88 showed mostly no corrosion loss since the 3/82 incident (although some concerns with the 24" horizontal sections that were RT'd pre-S/D showing 0.13" loss were



History Brief

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Report Date: August 15, 2012

Data Source: Meridium

noted during the 11/88 S/D RT/UT inspection of the line - these areas were not made available by the Ops/Maintenance supervision of the S/D). Subsequent NDE (from 11/88 to present) of the line at the TML's closest to them showed little or no corrosion.

The striplined areas have been inspected at every internal inspection of the atmospheric column C-1100 since that time; only minor weld repairs have been performed at PT indications and since 1995 no repairs have been performed even at those locations. These are assumed to be fabrication defects and have not changed since 1995 (see C-1100 internal inspection history briefs for more details).

A drawing showing the locations of the striplined areas will be given to Engineering for scanning into the computer and saving as a Reference Document.
